

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
14 March 2002 (14.03.2002)

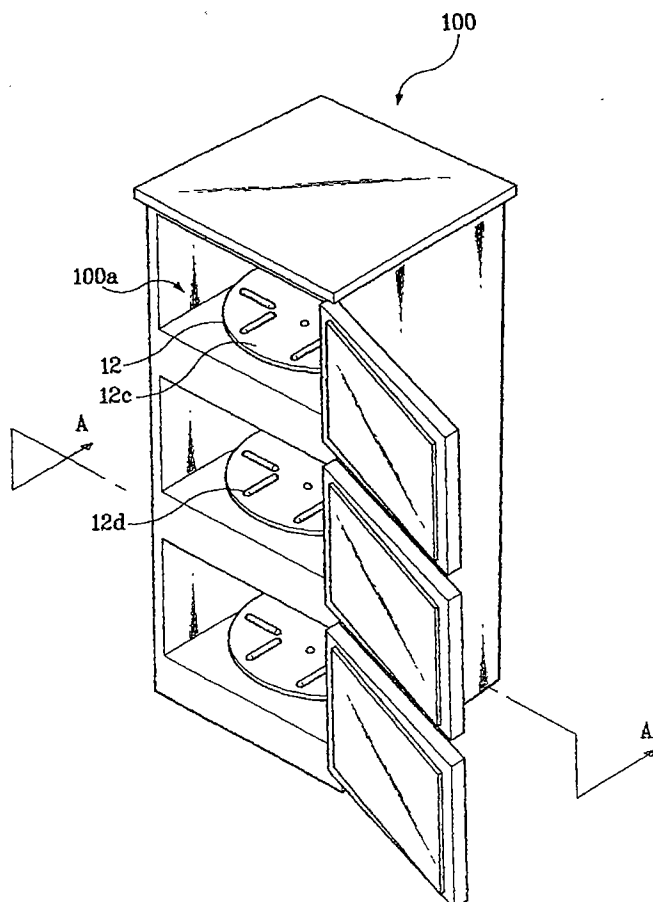
PCT

(10) International Publication Number  
**WO 02/21057 A1**

- (51) International Patent Classification<sup>7</sup>: **F25D 25/00**, 11/02, A47B 49/00
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- (21) International Application Number: **PCT/KR00/01397**
- (22) International Filing Date: 2 December 2000 (02.12.2000)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
2000-53098 7 September 2000 (07.09.2000) KR  
2000-25660(U.M.)  
8 September 2000 (08.09.2000) KR
- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
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[Continued on next page]

(54) Title: STORAGE DEVICE OF KIMCHI REFRIGERATOR



(57) Abstract: A storage device in a kimchi refrigerator is disclosed. A prior art kimchi refrigerator is provided that uses the cover type together the drawer type. However, it also has inconvenience in storing and taking out the kimchi from the refrigerator. In other words, it has inconvenience in that the above mentioned prior art kimchi refrigerator as well as the prior art drawer type refrigerator should have a plurality of doors in storing many kinds of kimchi so that the users should open or close each door when taking in or out the kimchi therefrom. Furthermore, although the prior art kimchi refrigerator has an advantage of storing a large-sized kimchi, a small-sized kimchi, which is stored in a container to be directly eaten by the users, should be stored in an ordinary refrigerator, not in the kimchi refrigerator. Accordingly, the present invention provides the storage device in the kimchi refrigerator (100) wherein a rotary plate (12), provided with a plurality of protrusive section lines (12d) to make a plurality of storage sections (12c), is coupled within a storage chamber (100a) of the kimchi refrigerator and then a plurality of kimchi storage containers (14) are stored in the corresponding storage section (12c) so that users can easily take out kimchi storage containers (14) in the front side of the kimchi refrigerator (100) by virtue of the rotation of the rotary plate (12).

WO 02/21057 A1



**Published:**

— with international search report

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## STORAGE DEVICE OF KIMCHI REFRIGERATOR

### BACKGROUND OF THE INVENTION

#### 5           Field of the Invention

The present invention relates generally to a storage device in a kimchi refrigerator. More particularly, the present invention relates to a storage device in a kimchi refrigerator wherein a rotary plate, provided with a plurality of protrusive section lines to make a plurality of storage sections, is coupled within a storage  
10 chamber of the kimchi refrigerator and then a plurality of kimchi storage containers are stored in the corresponding storage section so that users can easily take out kimchi storage containers in the front side of the kimchi refrigerator by virtue of the rotation of the rotary plate.

#### 15           Description of the Related Art

As kimchi is recognized as a health food, many special refrigerators have recently been developed which can separately chill and store the kimchi, at home as well as abroad.

20           The kimchi refrigerator is classified into a drawer opening and closing type and a cover opening and closing type. The cover type refrigerator can open and close its cover upwardly and downwardly at an upper portion of a kimchi storage chamber so that it has an advantage of chilling and storing kimchi properly. However, kimchi containers are stacked in the storage chamber each other, causing users inconvenience.

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Further, in case of the drawer type formed in the front side of the kimchi refrigerator, it has an advantage in that the users can easily pull and push the drawer

thereof, however, there is a problem in that it is difficult to chill and store the kimchi efficiently.

Thus, a prior art kimchi refrigerator is provided which uses the cover type  
5 together the drawer type. However, it also has inconvenience in storing and taking out the kimchi from the refrigerator.

In other words, it has inconvenience in that the above mentioned prior art  
kimchi refrigerator as well as the prior art drawer type refrigerator should have a  
10 plurality of doors in storing many kinds of kimchi so that the users should open or close each door when taking in or out the kimchi therefrom.

Furthermore, although the prior art kimchi refrigerator has an advantage of  
storing a large-sized kimchi, a small-sized kimchi, which is stored in a container to be  
15 directly eaten by the users, should be stored in an ordinary refrigerator, not in the kimchi refrigerator.

## SUMMARY OF THE INVENTION

20 It is, therefore, an object of the present invention to provide a storage device in a kimchi refrigerator wherein a rotary plate, provided with a plurality of protrusive section lines to make a plurality of storage sections, is coupled within a storage chamber of the kimchi refrigerator and then a plurality of kimchi storage containers are stored in the corresponding storage section so that users can easily take out kimchi  
25 storage containers in the front side of the kimchi refrigerator by virtue of the rotation of the rotary plate.

To achieve the above object, the presently claimed invention provides a storage

device in a kimchi refrigerator for keeping kimchi cool, which is comprised of: at least one floor of storage chamber; a circular groove with an open top end, which is formed at the center of the bottom of each storage chamber; a rotary plate which is adjacently positioned above the bottom of each storage chamber; a projection provided at the center of the lower side of the rotary plate, which sits down into the circular groove and rotates on its axis; a plurality of protrusive section lines on the upper side of the rotary plate, which forms a plurality of storage sections; and a plurality of kimchi storage containers each of which has top and bottom sides of the same configuration with that of corresponding storage section and sits onto corresponding storage section so that a user can store and take out kimchi in the front side of the kimchi refrigerator without regard to position by virtue of the rotation of the rotary plate.

### BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objects, features, and advantages of the present invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings in which:

FIG. 1 is a perspective view illustrating a construction of a storage device in a kimchi refrigerator according to an embodiment of the present invention;

FIG. 2 is a cross-sectional view of the present invention as taken along line A-A of FIG. 1;

FIG. 3 is a perspective view illustrating a kimchi storage container mounted onto a rotary plate according to an embodiment of the present invention;

FIG. 4 is a combined perspective view illustrating a storage device in a kimchi refrigerator according to an embodiment of the present invention;

FIG. 5 is a cross-sectional view illustrating a construction of a plurality of rotary plates stacked through a supporter according to an embodiment of the present

invention;

FIG. 6 is a combined cross-sectional view illustrating a rotation guiding member coupled with a rotary plate of a kimchi refrigerator according to an embodiment of the present invention; and

5 FIG. 7 is a perspective view illustrating a construction of a storage device in a kimchi refrigerator according to another embodiment of the present invention; and

FIG. 8 is a combined perspective view illustrating a storage device in a kimchi refrigerator according to another embodiment of the present invention.

## 10 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

A preferred embodiment of the present invention will be described herein below with reference to the accompanying drawings. For the purpose of clarity, well-known functions or constructions are not described in detail since they would obscure the invention in unnecessary detail.

15 FIG. 1 is a perspective view illustrating a construction of a storage device in a kimchi refrigerator according to an embodiment of the present invention. FIG. 2 is a cross-sectional view of the present invention as taken along line A-A of FIG. 1. FIG. 3 is a perspective view illustrating a kimchi storage container mounted onto a rotary plate according to an embodiment of the present invention. FIG. 4 is a combined perspective view illustrating a storage device in a kimchi refrigerator according to an embodiment of the present invention.

25 With reference to FIGs. 1 to 3, the storage device in a kimchi refrigerator for keeping kimchi cool is comprised of at least one floor of storage chamber 100a; a bearing groove 10; semicircular first and second supporting grooves 11 and 12b; a

rotary plate 12; a projection 12a; a plurality of protrusive section lines 12d; a ball 13; and a plurality of kimchi storage containers.

The storage chamber 100a is formed with at least one floor in the kimchi refrigerator 100 for keeping kimchi cool. The bearing groove 10 having a bearing sat down thereinto is formed at the center of the lower side of the storage chamber 100a. The semicircular first supporting groove 11 is formed around the bearing groove 10. The rotary plate 12 is adjacently positioned above the bottom of the storage chamber 100a. The projection 12a is provided at the center of the lower side of the rotary plate 12, which sits down into the bearing groove 10 and rotates on its axis. The semicircular second supporting groove 12b is formed around the projection 12a. The protrusive section line 12d is protrudingly formed on the upper side of the rotary plate 12 to make a plurality of storage sections 12c. The ball 13 is sat down between the first supporting groove 11 formed on the bottom of the storage chamber 100a and the second supporting groove 12b formed on the peripheral part of the lower side of the rotary plate, so as to prevent the rotary plate 12 rotating on the projection 12a from being shaken. The plurality of kimchi storage containers 14, each of which has top and bottom sides of the same configuration with that of the corresponding storage section 12c, is sat onto the corresponding storage section so that the users can store and take out the kimchi in the front side of the kimchi refrigerator without regard to position by virtue of the rotation of the rotary plate 12.

The above stated embodiment of the present invention will be explained below with reference to FIGs. 1 to 4.

First, the storage chamber 100a is formed with at least one floor in the kimchi refrigerator 100 for keeping the kimchi cool.

After that, the bearing groove 10 is formed at the center of the lower side of the storage chamber 100a and then, the bearing 200 is sat down into the bearing groove 10.

5 Further, the semicircular first supporting groove 11 is formed around the bearing groove 10 and the ball 13 is inserted into the first supporting groove 11. Then, the half of the lower portion of the ball 13 is inserted into the first supporting groove 11 and the other half of the upper portion thereof is exposed protrusively.

10 In the meanwhile, the rotary plate 12 is adjacently positioned above the bottom of the storage chamber 100a. That is, the projection 12a provided at the center of the lower side of the rotary plate 12, is inserted into the bearing groove 10 having the bearing 200 sat down therein so as to allow the rotary plate 12 to rotate on its axis.

15 At this time, the semicircular second supporting groove 12b is formed at the lower side of the rotary plate 12, that is, around the projection 12a and then, the half of the upper portion of the ball 13 which is already inserted into the first supporting groove 11 in the storage chamber 100a, is inserted into the second supporting groove 12b so as to support the rotation of the rotary plate 12.

20 Here, a plurality of the balls are rotatably formed along the circumference of the lower side of the rotary plate 12, each of which has a portion exposed downwardly. And a rail groove may be formed on the bottom of the storage chamber 100a for guiding the ball 13.

25 Further, a plurality of protrusive section lines 12d are protrudingly formed on the upper side of the rotary plate 12 to make a plurality of storage sections 12c. And



then, the storage device in the kimchi refrigerator is completely assembled through sitting the kimchi storage container 14 down into the corresponding storage section 12c.

5 It is preferable that the kimchi storage container has top and bottom sides of the same configuration with that of corresponding storage section 12c.

Moreover, it is preferable that the protrusive section lines 21d are disposed radially on the upper side of the rotary plate 12, and form a section having a certain dimension in the middle and nine storage sections around the outer circumference of the upper side of the rotary plate 12 in order to store nine kimchi storage containers.

10 In the aforementioned manner, the kimchi storage device in the kimchi refrigerator has the rotary plate 12 whose each edge side is supported through the ball 13 being inserted between the first and second supporting grooves 11 and 12b, and which rotates on the projection 12a and bearing 200 sat down into the bearing groove 10 as its axis, so that the users can store and take out the kimchi in the front side of the kimchi refrigerator without regard to position by virtue of the rotation of the rotary plate.

20 As shown in FIG. 5, a supporter 15 is erected at the center of the upper side of the rotary plate 12 and another rotary plate 12' having a supporting hole (not shown) is accumulatively stacked with more than two floors above the supporter through the supporting hole. This is to have many kimchi storage containers in the storage chamber by shortening the height thereof

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At this time, it is preferable that a plurality of supporting bars for fixing the rotary plates 12 and 12' are erected along the peripheral between the rotary plates 12

and 12' within the possible range of the kimchi storage container's withdrawal.

Further, as shown in FIG. 6, a separate rotation guiding member 16 for facilitating the rotation of the rotary plate 12 may be mounted on the bottom part of the inner wall of the kimchi storage chamber 100a, and the outer peripheral of the rotary plate 12 may be inserted into the rotation guiding member 16.

In the meanwhile, FIGs. 7 and 8 illustrate a construction of the storage device in the storage chamber 100a of the kimchi refrigerator 100 according to another embodiment of the present invention, the storage device being attachable and detachable to and from the storage chamber thereof.

FIG. 7 is a perspective view illustrating a construction of a storage device in a kimchi refrigerator according to another embodiment of the present invention. And, FIG. 8 is a combined perspective view illustrating a storage device in a kimchi refrigerator according to another embodiment of the present invention.

The construction of the kimchi storage device according to another embodiment of the present invention will now be described in detail, with reference to FIGs. 7 and 8.

Referring to FIGs. 7 and 8, the storage device in the kimchi refrigerator for keeping the kimchi cool has a rotary airtight container which is attachable and detachable to and from the storage chamber of the kimchi refrigerator, the above rotary airtight container comprised of an upper plate 21, a lower plate 22, a supporter 23, a rotary plate 24, and a plurality of kimchi storage containers.

The upper plate 21 of a certain dimension closely contacts with the upper side of the kimchi storage chamber 100a. The lower plate 22 of a dimension and a configuration corresponding to the upper plate 21, has a bearing groove 22a on its upper side and closely contacts with the bottom side of the kimchi storage chamber 100a. The upper end of the supporter 23 is inserted into the center of the lower side of the upper plate 21 and the lower end thereof is fixed rotatably into the bearing 200 of the lower plate 22. The rotary plate 24 is fixed with the supporter 23 through upper and lower bearings and is provided with a plurality of protrusive section lines 24a to make a plurality of storage sections on its upper side. Each kimchi storage container has top and bottom sides of the same configuration with that of corresponding storage section and sits onto corresponding storage section so that the users can store and take out the kimchi in the front side of the kimchi refrigerator without regard to position by virtue of the rotation of the rotary plate 24.

The protrusive section lines 24a is a guide line for guiding the kimchi storage containers to be positioned.

As shown in FIG. 8, the protrusive section lines 24a are fixed between the upper plate 21 and lower plate 22 to be mounted on the rotary plate 24.

Further, the kimchi storage containers are positioned on the rotary plate 24 to easily draw out one of them outside. Thus, when selectively drawing out the kimchi storage container 25 storing a desired kimchi, the kimchi storage container 25 will be positioned in the front side of the kimchi refrigerator in virtue of the rotation of the rotary plate 24. Thereafter, the users can easily draw out or store the desired kimchi storage container 25 in one direction.

Although not shown in FIGs 7 and 8, another rotary plate having a supporting hole can be accumulatively stacked with more than two floors above the supporter through the supporting hole.

5           As described above, the present invention has an effect in that a rotary plate, provided with a plurality of protrusive section lines to make a plurality of storage sections, is coupled within a storage chamber of the kimchi refrigerator and then a plurality of kimchi storage containers are stored in the corresponding storage section so that users can easily take out kimchi storage containers in the front side of the kimchi  
10 refrigerator by virtue of the rotation of the rotary plate.

          While the invention has been shown and described with reference to a certain preferred embodiment thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the  
15 spirit and the scope of the invention as defined by the appended claims.

**WHAT IS CLAIMED IS :**

1. A storage device in a kimchi refrigerator for keeping kimchi cool, comprising:

at least one floor of storage chamber;

5 a circular groove with an open top end, which is formed at the center of the bottom of each storage chamber;

a rotary plate which is adjacently positioned above the bottom of each storage chamber;

10 a projection provided at the center of the lower side of the rotary plate, which sits down into the circular groove and rotates on its axis;

a plurality of protrusive section lines on the upper side of the rotary plate, which forms a plurality of storage sections; and

15 a plurality of kimchi storage containers each of which has top and bottom sides of the same configuration with that of corresponding storage section and sits onto corresponding storage section so that a user can store and take out kimchi in the front side of the kimchi refrigerator without regard to position by virtue of the rotation of the rotary plate.

20 2. A storage device in a kimchi refrigerator for keeping kimchi cool according to claim 1, wherein protrusive section lines are disposed radially on the upper side of the rotary plate, and form a section having a certain dimension in the middle and nine storage sections around the outer circumference of the upper side of the rotary plate in order to store nine kimchi storage containers.

25 3. A storage device in a kimchi refrigerator for keeping kimchi cool according to claim 1, wherein a supporter is erected at the center of the upper side of the rotary plate and another rotary plate having a supporting hole is accumulatively

stacked with more than two floors above the supporter through the supporting hole.

4. A storage device in a kimchi refrigerator for keeping kimchi cool according to claim 1, wherein a separate rotation guiding member for facilitating the rotation of the rotary plate is mounted on the bottom part of the inner wall of the kimchi storage chamber, and the outer peripheral of the rotary plate is inserted into the rotation guiding member.

5. A storage device in a kimchi refrigerator for keeping kimchi cool according to claim 1, wherein a bearing is inserted into the circular groove for more smooth rotation of the projection.

6. A storage device in a kimchi refrigerator for keeping kimchi cool according to claim 1, wherein a plurality of balls are provided between the bottom of the kimchi storage chamber and the peripheral part of the lower side of the rotary plate in order to support the rotation of the rotary plate.

7. A storage device in a kimchi refrigerator for keeping kimchi cool according to claim 1, wherein the ball is rotatably fixed into the lower side of the rotary plate and the other portion thereof is exposed, and a rail groove is formed on the bottom of the kimchi storage chamber for guiding the ball.

8. A storage device in a kimchi refrigerator for keeping kimchi cool, having a rotary airtight container which is attachable and detachable to and from a storage chamber of the kimchi refrigerator, wherein the rotary airtight container comprising:

an upper plate of a certain dimension, which closely contacts with the upper side of the kimchi storage chamber;

a lower plate of a dimension and a configuration corresponding to the upper plate, which has a bearing groove on its upper side and closely contacts with the bottom side of the kimchi storage chamber;

5 a supporter whose upper end is inserted into the center of the lower side of the upper plate and whose lower end is fixed rotatably into the bearing of the lower plate;

a rotary plate which is fixed with the supporter through upper and lower bearings and is provided with a plurality of protrusive section lines forming a plurality of storage sections on its upper sides; and

10 a plurality of kimchi storage containers each of which has top and bottom sides of the same configuration with that of corresponding storage section and sits onto corresponding storage section so that a user can store and take out kimchi in the front side of the kimchi refrigerator without regard to position by virtue of the rotation of the rotary plate.

15 9. A storage device in a kimchi refrigerator for keeping kimchi cool according to claim 8, wherein at least one rotary plate is stacked along the axis of the supporter.

20 10. A storage device in a kimchi refrigerator for keeping kimchi cool according to claim 8, wherein a plurality of supporting bars for fixing the rotary plates are erected along the peripheral between the rotary plates, one plates being at a certain distance from another one.





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FIG. 1

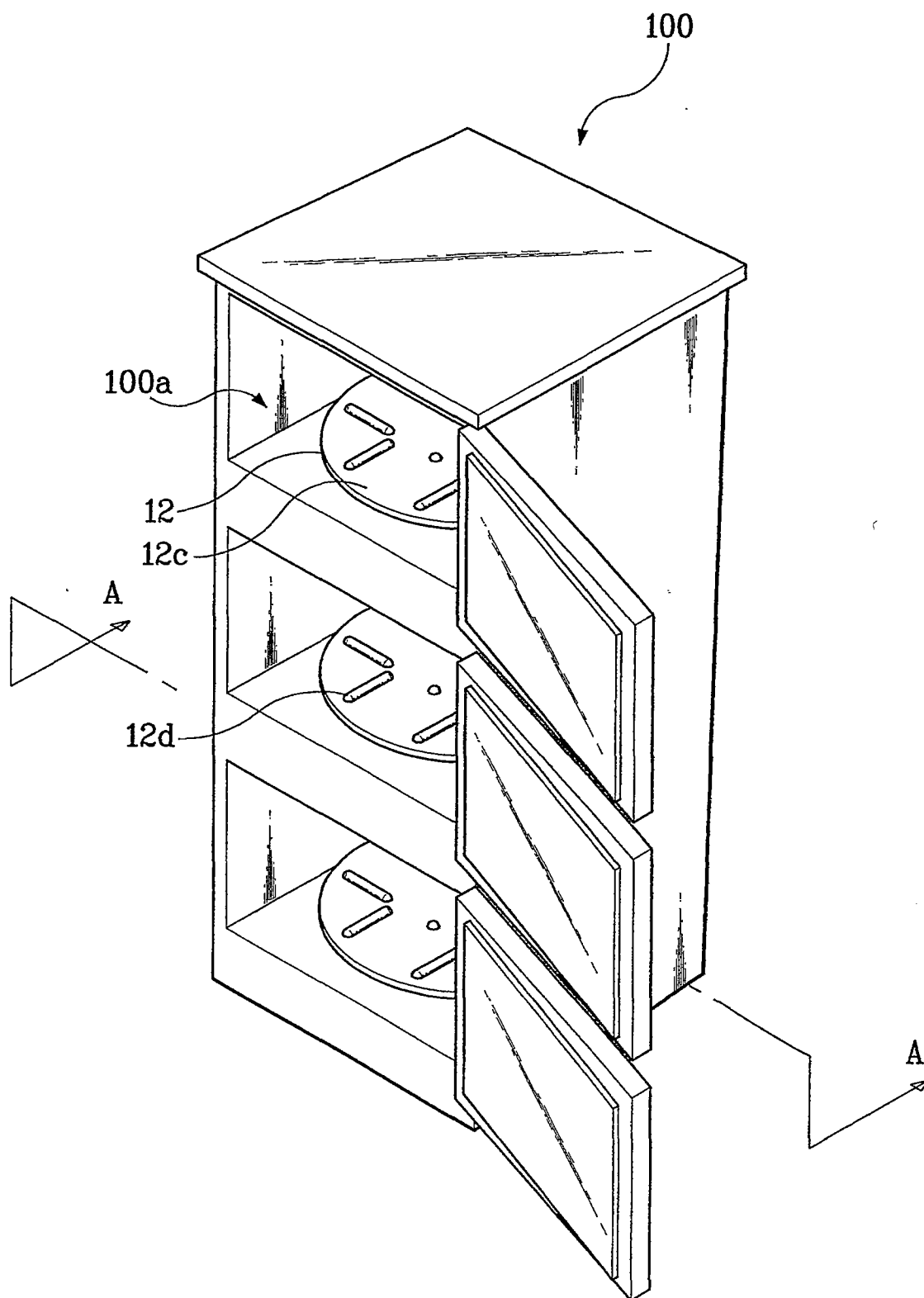
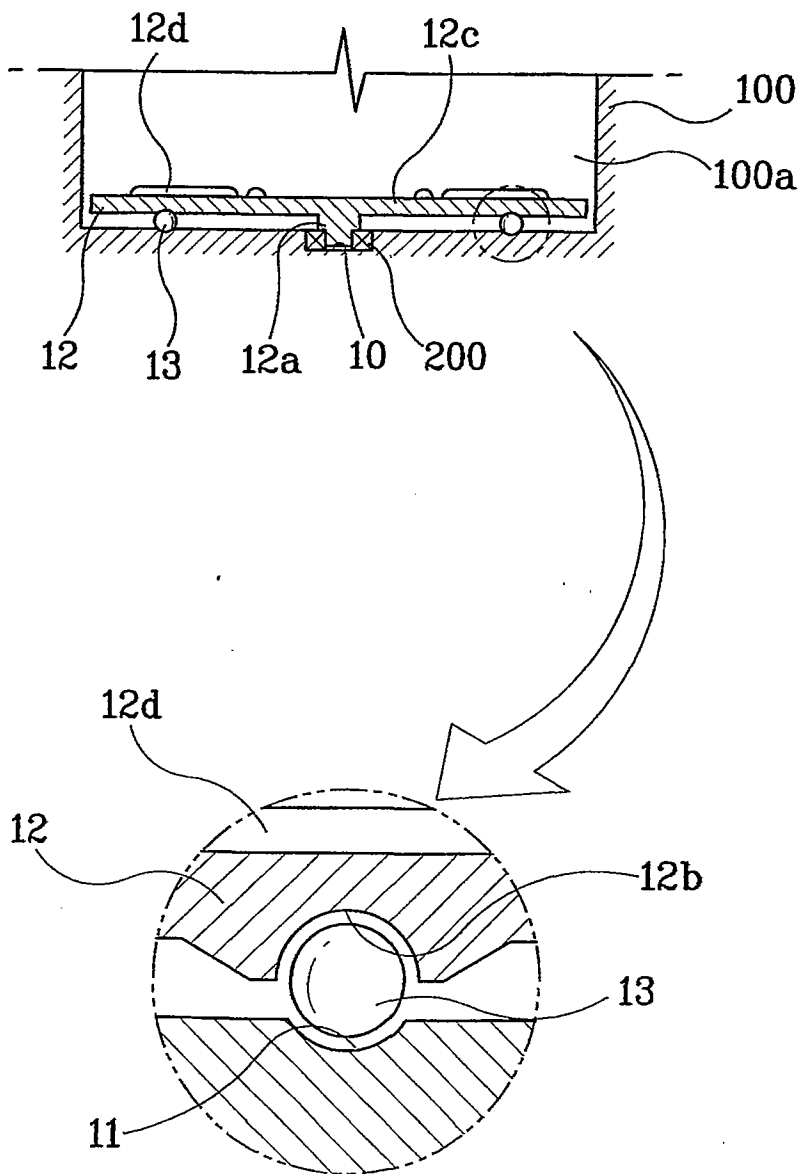




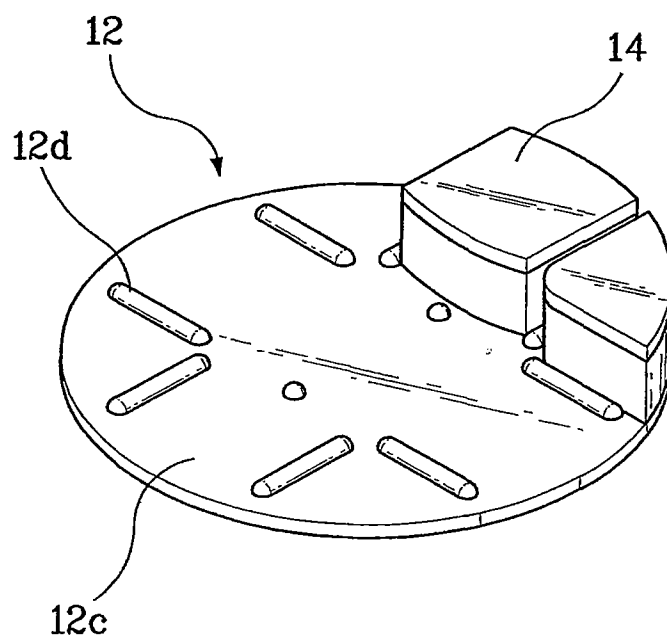
FIG. 2





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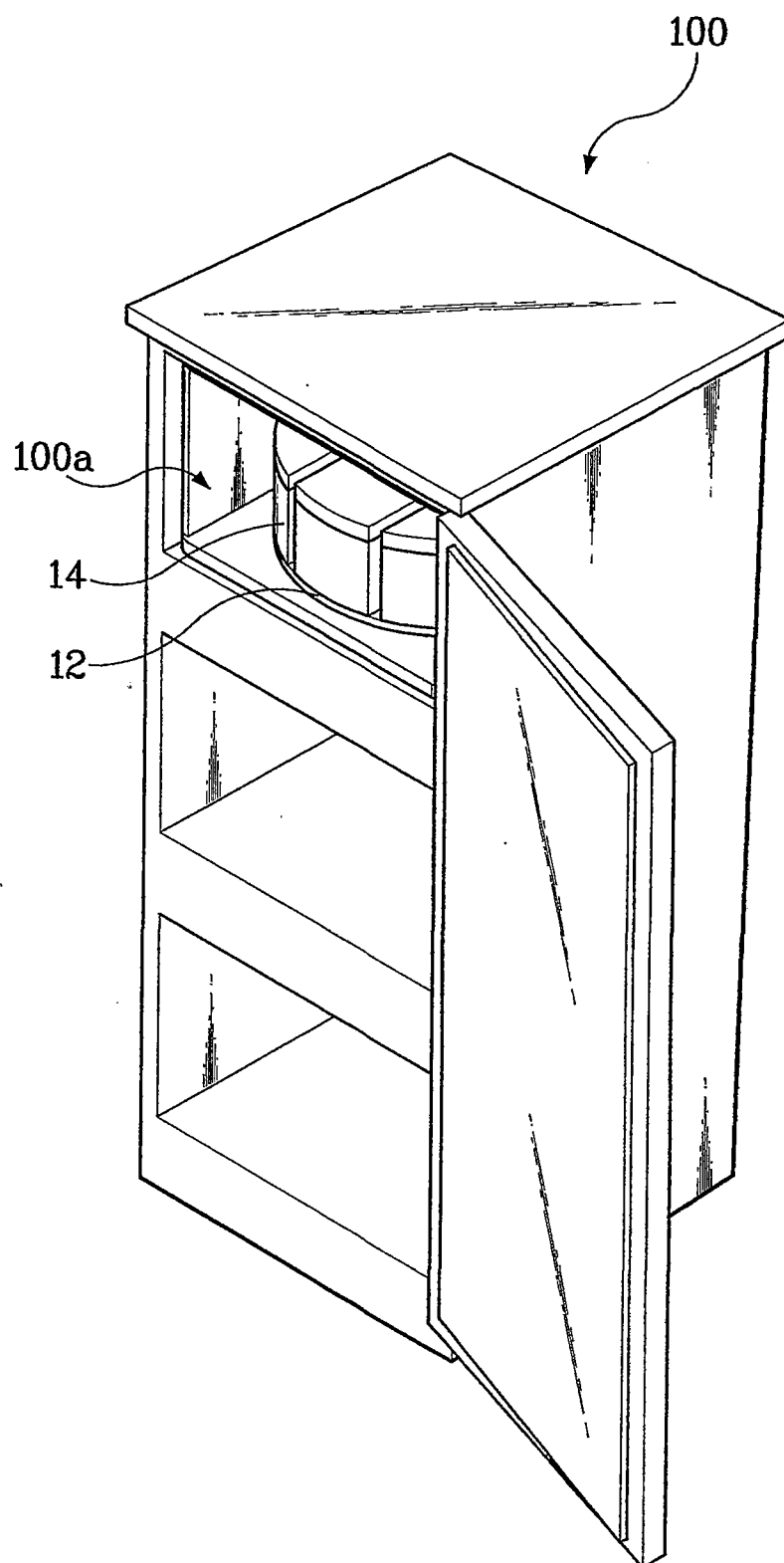
FIG. 3





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FIG. 4







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FIG. 5

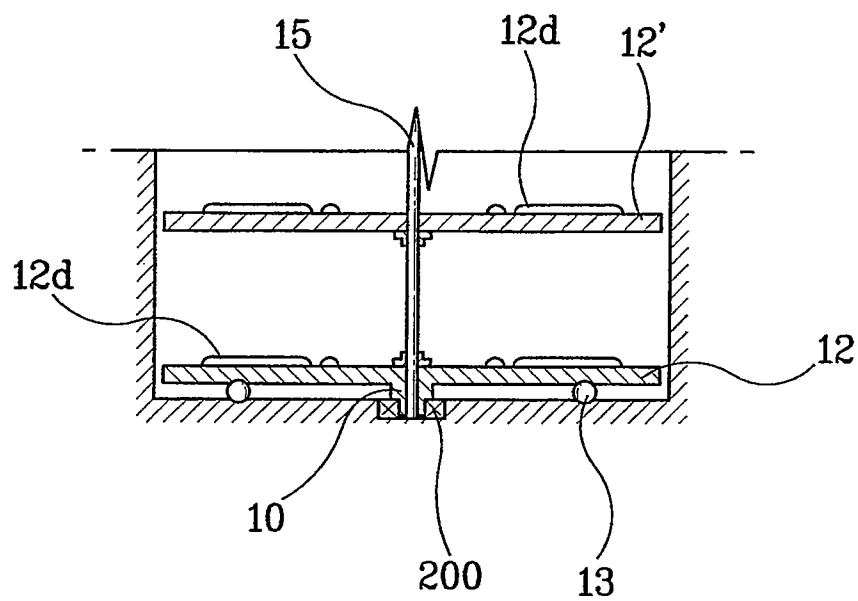
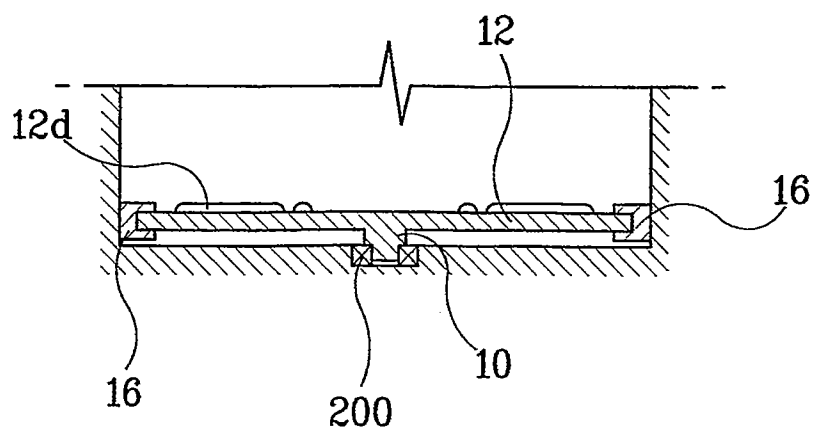


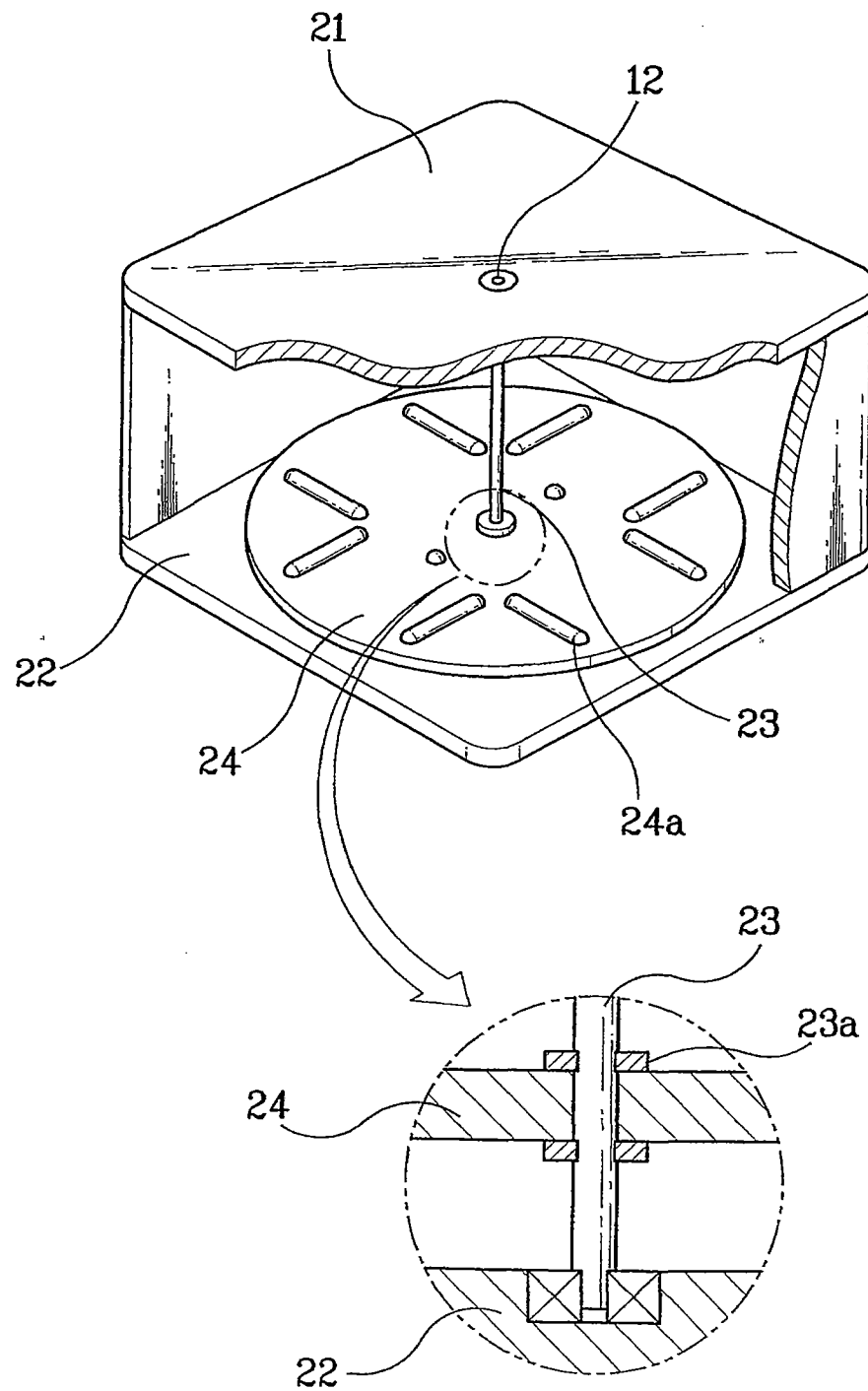
FIG. 6





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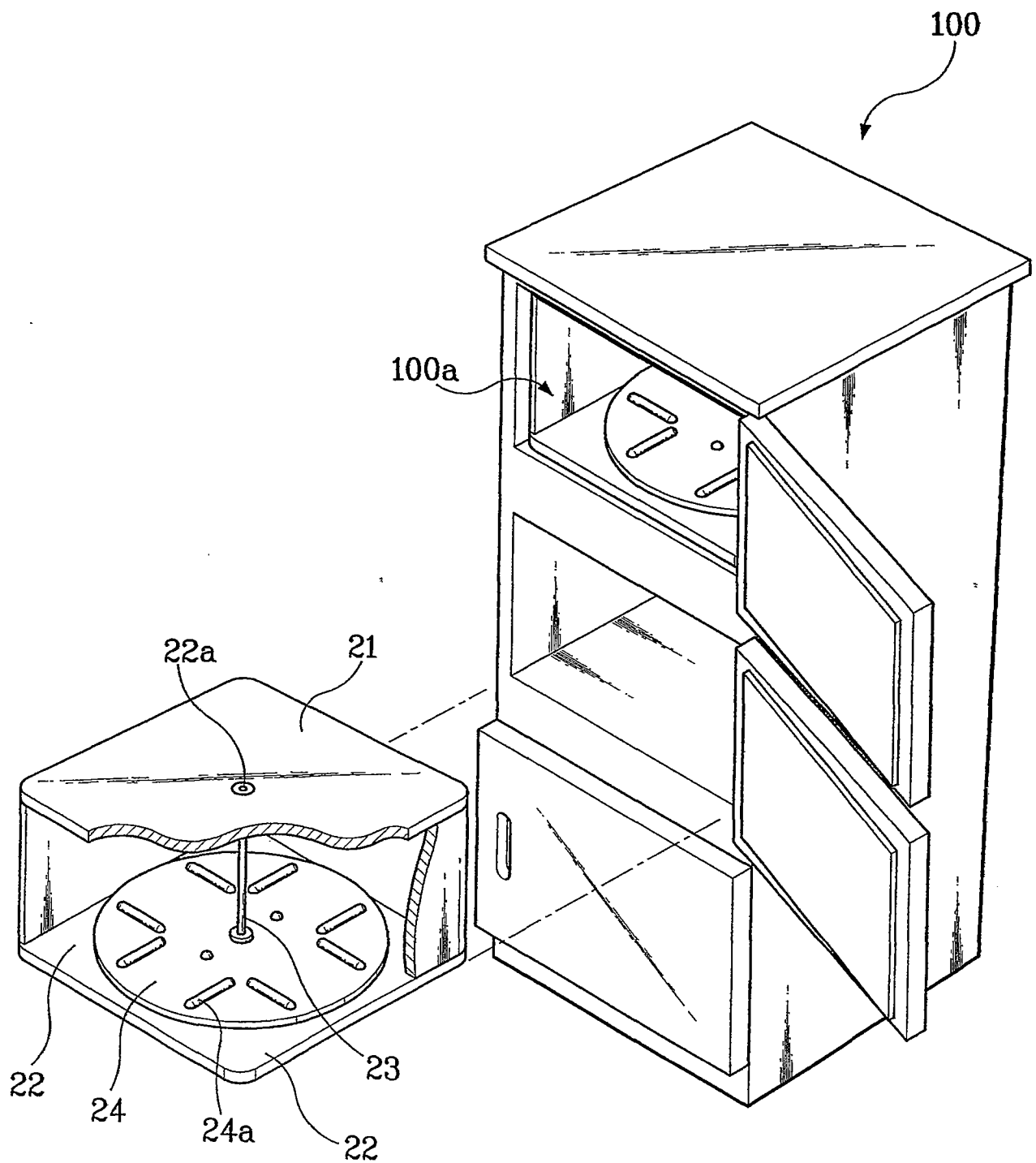
FIG. 7





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FIG. 8





## INTERNATIONAL SEARCH REPORT

International Application No.  
PCT/KR 00/01397

## CLASSIFICATION OF SUBJECT MATTER

IPC<sup>7</sup>: F25D 25/00 , F25D 11/02 , A47B 49/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC<sup>7</sup>: F25D , A47B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI , EPODOC , PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CH 158778 A (EISINGER) 16 February 1933 (16.02.33) <i>the whole document.</i>	1-3,8,9
A	EP 0452977 A (SANYO ELECTRIC) 23 October 1991 (23.10.91) <i>fig. 1,2 ;column 5 line 47 to column 6 line 7.</i>	1,6,8
A	US 5277488 A (Cleary) 11 January 1994 (11.01.94) <i>the whole document.</i>	1,3,8,9
A	US 4191437 A (Funke) 4 March 1980 (04.03.80) <i>fig. 1,7,9,13-15; claims.</i>	1,6-8
A	DE 4216765 A1 (Hermann Forster AG) 17 December 1992 (17.12.92) <i>the whole document.</i>	1,8
A	US 5458186 A (Lee) 17 October 1995 (17.10.95)	

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

\* Special categories of cited documents:

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„&amp;“ document member of the same patent family

Date of the actual completion of the international search

18 May 2001 (18.05.2001)

Date of mailing of the international search report

7 June 2001 (07.06.2001)

Name and mailing address of the ISA/AT

Austrian Patent Office

Kohlmarkt 8-10; A-1014 Vienna

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR 00/01397

Patent document cited in search report			Publication date	Patent family member(s)			Publication date
CH	A	158778				none	
DE	A1	4216765	17-12-1992	DE	U1	9219053	19-06-1997
				CH	A	683680	29-04-1994
				FR	A1	2677441	11-12-1992
				FR	B1	2677441	11-04-1997
EP	A	0452977				none	
US	A	4191437	04-03-1980			none	
US	A	5277488	11-01-1994			none	
US	A	5458186	17-10-1995			none	
US	A	5458186	17-10-1995	KR	Y1	9407932	10-11-1994
US	A	5458186	17-10-1995				
US	A	5458186	17-10-1995				